



## Bowel Preparation Are Antibiotics Necessary for Colorectal Surgery?

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### Keywords

- Mechanical bowel preparation • Antibiotics • Colorectal surgery
- Surgical site infection • Anastomotic leak • Outcomes • Complications • Quality

### Key points

- The goal of bowel preparation is to facilitate safe surgery and reduce post-operative complications.
- The use of antibiotic prophylaxis in colorectal surgery is essential, not controversial.
- Historical evidence supports the use of oral antibiotics in combination with mechanical cleansing for the reduction of infectious complications.
- Prophylactic intravenous antibiotic administration at induction in clean-contaminated surgery is now both routine and mandatory.
- Oral and intravenous antibiotics with mechanical bowel preparation show improved colectomy-specific outcomes compared with no preparation or mechanical bowel preparation plus intravenous antibiotics alone.

The authors have nothing to disclose.

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## INTRODUCTION: BACKGROUND

The aim of bowel preparation is to prime the colon for surgery, reduce septic complications and facilitate safe surgery. Evidence for the benefits of antibiotic preparation in colorectal surgery has existed for more than 50 years. The argument concerning combined use of antibiotics and mechanical bowel preparation (MBP), as well as any of the individual components, has continued to evolve. Recent recommendations suggest dispensing with bowel preparation be altogether. However, the pendulum is swinging back towards maximal preparation with MBP and oral antibiotics.

In 1938, Garlock and Seley [1] first published results demonstrating improved outcomes following antimicrobial use as an aid to colon surgery. The use of MBP in combination with oral antibiotics became routine practice in the 1970s with the preparation proposed by Nichols and Condon [2] emerging as the standard preoperative regimen. A significant body of evidence supported its use in reducing the high level of postoperative septic complications associated with colorectal surgery [3–6]. Common practice in North America at that time was aligned with available best evidence.

It seems that 3 factors challenged this prevailing practice in the 1990s and early 2000s: (1) the drive towards preoperative intravenous (IV) antibiotic use, (2) evidence demonstrating a lack of effectiveness of MBP alone, and (3) concerns regarding the emergence of resistant bacterial strains or *Clostridium difficile*. With the trend towards the omission of bowel preparation altogether and administering IV antibiotics at induction, it seems oral antibiotics were thought perhaps unnecessary, ineffective in a loaded colon, or even harmful.

Recent retrospective observational studies using national multi-institutional surgical outcomes data have clearly shown a benefit for oral antibiotics and MBP over and above IV antibiotics, and greater still than without mechanical cleansing at all [7–10]. In addition, there is decent evidence to refute any significant increase in *C difficile* rates [10]. The questions remaining to be answered are: do oral antibiotics act effectively, even in a loaded colon, and are different regimens required for colonic versus rectal resections or for minimally invasive versus open surgery? There is no recent level I evidence evaluating the role of oral antibiotics in preparation, mechanical or otherwise.

## SIGNIFICANCE

Intraoperative manipulation of the colon presents a significant risk for bowel flora contamination and, for this reason, colorectal surgery is a high outlier for surgical site infection (SSI) [11]. Reducing rates is a priority for both patients and physicians because SSI is associated with significant morbidity, increased length of stay, intensive care admission, hospital-associated costs, and death [12]. Effective preoperative preparation of the colon has the potential to significantly reduce septic complications, including SSI and anastomotic leak.

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